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Wall modeled LES of wind turbine wakes with geometrical effects LAURENT BRICTEUX, UMONS, PIERRE BENARD, CORIA, STEPHANIE ZEOLI, UMONS, VINCENT MOUREAU, GHISLAIN LARTIGUE, CORIA, AXELLE VIRE, TU-DELFT — This study focuses on prediction of wind turbine wakes when geometrical effects such as nacelle, tower, and built environment, are taken into account. The aim is to demonstrate the ability of a high order unstructured solver called YALES2 to perform wall modeled LES of wind turbine wake turbulence. The wind turbine rotor is modeled using an Actuator Line Model (ALM) while the geometrical details are explicitly meshed thanks to the use of an unstructured grid. As high Reynolds number flows are considered, sub-grid scale models as well as wall modeling are required. The first test case investigated concerns a wind turbine flow located in a wind tunnel that allows to validate the proposed methodology using experimental data. The second test case concerns the simulation of a wind turbine wake in a complex environment (e.g. a Building) using realistic turbulent inflow conditions.

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